Discourse markers in speech

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Discourse Markers in Speech: Characteristics and Challenges for Corpus Annotation

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Abstract

It is generally acknowledged that discourse markers are used differently in speech and writing, yet many general descriptions and most annotation frameworks are written-based, thus partially unfit to be applied in spoken corpora. This paper identifies the major characteristics of discourse markers in spoken language, which can be associated with problems related to their scope and structure, their meaning and their tendency to co-occur. The description is based on authentic examples and is followed by methodological recommendations on how to deal with these phenomena in more exhaustive, speech-friendly annotation models.

Keywords: discourse markers, corpus annotation, speech, linguistic complexity, mode of communication

1 Introduction

Within the large literature on discourse markers (henceforth DMs), a number of studies investigate how uses differ according to the mode of communication (see for instance Chafe, 1982; Horowitz and Samuels, 1987; Castellà, 2004; Biber, 2006; López Serena and Borreguero Zuluoga, 2010). Yet corpus-based analysis of spoken discourse is still quite infrequent, or focused on very specific phenomena (see López Serena and Borreguero Zuluoga, 2010; Ciabarri, 2013; Cuenca, 2013a; Crible, 2017 for some exceptions). Similarly, most annotation models of DMs are designed for written discourse. This is the case of the Rhetorical Structure Theory or RST (Mann and Thompson, 1988), the Penn Discourse Treebank or PDTB 2.0 (Prasad et al., 2008) and the Cognitive approach to Cognitive Relations or CCR (Sanders et al., 1992) – although there are some recent endeavors to apply these frameworks to speech (e.g., Tonelli et al., 2010 for PDTB in spoken Italian). Despite this predominance of writing-based models, spoken and spoken-like corpora are increasingly available with large databases such as the Spoken BNC2014 project for English or C-Oral-Rom for Romance languages. Therefore, this paradoxical situation calls for the need to take into account the

particular characteristics of spoken language both for descriptive adequacy and in order to extend writing-based annotation models, or even to design multimodal models (Crible and Zufferey, 2015).

This paper aims at identifying the major characteristics of discourse markers that relatively differ (in nature, frequency or degree) between spoken and written language, and discusses the problems that they pose for corpus annotation. Besides examples and some corpus-based quantitative findings of the distribution of these features, the paper also provides a review of how existing writing-based frameworks handle (or not) the particular characteristics of spoken DMs. This qualitative discussion of the challenges of spoken discourse annotation will lead to methodological recommendations to enhance the validity of future corpus-based research.

2 Spoken vs. Written Mode of Communication and the Use of DMs

In this section, we report on previous descriptive works which identified relative differences between the spoken and written modes of communication (Section 2.1), and their resulting impact on the use of DMs (Section 2.2).

2.1 Characteristics of Speech and Writing

It seems uncontroversial that written and oral texts are produced and processed differently (see, e.g., Horowitz and Samuels, 1987). As a consequence, DMs are expected to behave differently according to the mode of communication. However, linguistic complexity in speech and writing is a controversial matter.

Two opposite positions can be distinguished. Chafe (1982) and many other authors consider that oral grammar is simpler than written grammar. Chafe argues that there are two dichotomies that account for this fact: syntactic fragmentation vs. integration and detachment vs. involvement. Halliday (1987) represents the opposite, and less popular, perspective. Halliday argues that the grammar of speech is complex and so the idea that speech is structureless is a myth. "Speech is not, in any general sense, 'simpler' than writing; if anything, it is more complex" (Halliday, 1987: 65). What seems to be uncontroversial is that spoken and written language differ as for their respective kind of complexity. Written language tends to be lexically dense but grammatically "simple" or rather "regular". Conversely, speech is grammatically intricate but lexically sparse, as illustrated by the frequent cases of underspecification, implicitness and/or ambiguity in spoken language: "speech [is] processlike, intricate, with meanings related serially" (Halliday, 1987: 79-80). Their preferred patterns of organization are therefore different.

An important methodological assumption (or conclusion) of Halliday's perspective is that the term *mode of communication* must be understood in a wide sense: mode is not only (or mainly) the medium, but the contextual factors attached to it.[1] Although the mode of communication, either spoken or written, is an important factor to account for the selection and frequency of discourse markers, other factors, namely planning and interactivity, must also be taken into account.

Planning is more likely to be carried out in written texts. Planning is directly related to the following features: "face-to-text", not space-time bound, secondary discourse and consciousness. It can also be directly associated with formality, since informal texts are usually not planned, whether they are oral or written. That is why an informal and non-revised text by a non-expert often sounds like spoken language. The other side of planning is revision once the message has been textualized. Revision is only possible with permanent products.

Interactivity, that is, the presence and activity of the hearer explicitly expressed from the speaker's point of view, is more likely to occur in spoken texts or, rather, in face-to-face interaction,

[1] The same position is put forward in Bazzanella (2001).

including "speech-like" modes of mediated communication (e.g. chats). Interactivity is related to face-to-face communication, addressor-addressee reciprocity and interpersonal discourse, as opposed to objective and distant communication. It can be related to an additional factor, namely, emotivity. Emotivity is typically linked to orality, informal communication and unplanned texts (see Cuenca and Romano, 2013). In fact, Koch and Österreicher (1990: 12) identify intimacy and emotional implication as factors defining communicative proximity (vs. affective distance and lack of emotional implication).[2]

In short, speech is not always unplanned and interactive (e.g. a broadcast political speech) and writing is not necessarily planned and non-interactive (e.g. text-based chats). The opposition between speech and writing should therefore be refined by taking these contextual factors into account, so that we will henceforth always specify what particular type of discourse is at stake.

2.2 DMs in Speech vs. Writing

A number of previous analyses of the linguistic complexity of oral and written texts have taken into account the use of DMs. In this section, two of them will be reviewed, namely Castellà (2004) and Biber (2006).

Castellà (2004) analyzes three discourse genres in Catalan (informal conversation, academic lecture and written academic prose) by focusing on three aspects of linguistic structure and complexity: lexical density, compound sentences, and text connection. Castellà's main conclusion is that spoken informal texts, spoken formal texts (expository) and written formal texts result from different discourse-building strategies (2004: 149). This fact has an impact on both the linguistic complexity of the discourse and the use of DMs. Specifically,

- Spoken conversation exhibits a verbal style (more verbs and verbal complements) whereas written exposition has a more nominal style (more nouns and noun complements). As a consequence, written prose organizes information through integration of structures (complex phrases, mainly noun phrases, and clauses), while conversation includes more reduced phrases and clauses, flexible structures and more repetition. Writing is, then, denser and more lexically varied.
- Written texts tend to relate text units as compound sentences, whereas spoken texts make a profuse use of text connection.
- Orality combines intonation, sentential connection and text connection to link units. Writing, in contrast, heavily relies on sentential connection alone.
- All texts, whether written or spoken, use a similar number of subordination constructions. Informal conversations include a similar number of subordinators in absolute terms and in relation with the number of words, although fewer if we consider the total number of clauses. This puzzling fact (the *paradox of complexity*, as Castellà names it) has to do with the tendency to an increase of subordinators because of two different preferred strategies: a verbal style, typical of speech, implies connection between verbal units; similarly, an integrated style, typical of writing, relies on sentential connection.

As for the use of DMs, some conclusions can be drawn from Castellà's analysis:

- Informal conversation resorts more often to conjunctions and all kinds of DMs as text connectives. Spoken expository prose is more similar to written prose in the use of conjunctions as text connectives, but to informal conversation in the use of other connectives.
- Spoken genres use a more reduced variety of connectives, but they are more polyfunctional.

[2] In the words of Tannen (1982: 15), interpersonal involvement characterizes orality, whereas written texts are more message-oriented.

- Some connectives and some uses of certain connectives seem to be typical of one type of text.

Douglas Biber, in his monograph on *University Language* (2006), analyzes a wide range of the registers found in American universities, both spoken (classroom teaching, classroom management, office hours, study groups, service encounters) and written (academic textbooks, course management, institutional writing). As for the use of DMs, Biber (2006: chapter 4) concludes that:

- Linking adverbials, such as *however, therefore, for example, that is*, are found in both spoken and written registers but "are primarily characteristic of written registers" (2006: 70), mainly of textbooks.
- "Discourse markers" (such as *okay, well, now*) are "restricted primarily to spoken discourse" (2006: 66).
- As for dependent clauses, "overall patterns of use […] run exactly opposite to […] prior expectations, with dependent clauses overall being more common in the spoken university registers than in the written registers" (Biber, 2006: 72). Specifically, adverbial clauses and complement clauses, especially *that*-clauses, are more frequent in speech, whereas relative clauses occur in both modes of discourse depending on the genre but are more common in written registers.

To sum up, our intuition as linguists or even as speakers is that, since written and spoken texts are produced and processed in a different way, discourse markers should exhibit a different behavior accordingly. However, previous studies have shown that the analysis of written and spoken texts does not lead to a straightforward conclusion. Orality is not a homogeneous phenomenon and thus there are many intermediate cases between the pole represented by (prototypical) spoken texts and (prototypical) written texts. Similarly, it is possible to identify spoken texts with a structure and use of DMs that resemble that of written texts, and also written texts that echo orality. Nonetheless, the analysis of spoken texts shows that the use of DMs tends to exhibit some relative differences or tendencies. This is especially the case in spontaneous speech, where planning is low, and in dialogue, where interactivity is high.

3 Materials and Present Approach to DMs

In the following sections, some characteristics of spoken DMs will be discussed and illustrated by naturally-occurring examples taken from *DisFrEn*, a French-English comparable corpus fully annotated for discourse markers (Crible, 2017b). This dataset comprises 15 hours of recordings (161,700 words) balanced across a variety of more or less formal settings such as conversations, interviews or political speeches. The English transcripts were compiled from existing corpora, namely the British component of the International Corpus of English (Nelson et al., 2002) and the Backbone project (Kohn, 2012). A total of 8,743 DM items have been identified and annotated following the definition and guidelines in Crible (2017a): DMs were identified through a bottom-up selection (no closed list) provided they met the criteria of procedurality, syntactic optionality, fixedness (i.e. grammaticalized), discourse-level scope and metadiscursive function (discourse relation, topic structure, turn exchange, speaker-hearer relationship). This definition includes in effect expressions as varied as conjunctions (*and, but, although*), adverbs (*actually, well*), prepositional phrases (*in fact, by the way*) or verb phrases (*you know, I mean, if you will*), among others.

The annotation covers syntactic position, co-occurrence and sense disambiguation. Crible and Degand (forthcoming) report on moderate inter-annotator agreement score (Fleiss' kappa = 0.563, relative agreement 70.9%) while intra-annotator agreement, performed on 10% of the whole corpus, is higher (κ = 0.74, 75.8% of relative agreement). This data will be used to quantify the

characteristics under discussion in this paper, comparing, when available, results from available written corpora (mostly the PDTB corpus of Wall Street Journal, Prasad et al., 2008).

4 DMs in Unplanned Speech: The Scope of DMs and Discourse Structure

The standard use of DMs implies two complete and identifiable arguments, which are consecutively attached to a DM. However, in speech, and especially in unplanned and/or interactive discourse, this is not always the case. One of the two arguments can be missing, incomplete or implicit (truncated structures) and the two arguments can be complex and interrupted by different arguments (far-reaching scope), so that the linear structure corresponding to the construction "Arg_1 DM Arg_2" does not always match its semantic structure.

4.1 Truncated Structures

Structures containing DMs in unplanned speech are often truncated (that is, the second argument is missing or is not complete) or independent (the first argument is implicit), whereas in written/planned discourse the structures tend to be continuous and complete because the text is presented as a finished product (instead of an on-going process in speech, cf. Halliday 1987: 65). This fragmentation of unplanned spoken syntax affects the annotation process by blurring the function of DMs in truncated structures and generates incomplete argument pairs. Stent (2000) already noticed this feature of dialogs in her application of RST to conversational data, which led her to discard abandoned utterances from the scope of the annotation. She further notes that full representation of discourse structure as proposed by the RST framework cannot be fully achieved "given the length and complexity of a typical dialog" (2000: 250). Cases of missing Arg2 and missing Arg1 are respectively illustrated in Examples (1) and (2).

(1) ICE24: I was hoping it'd be a week so I could get off the ward for a bit **but**
ICE25: oh already?
ICE12: <laughing/> well you know it's nice to have a change (EN-phon-05)

(2) ICE25: I'll walk down anyway so I can get one
ICE26: oh right ok
ICE25: **so** (0.573) um (1.730) **so** are you still on call at work (EN-phon-05)

In (1), the second argument of "but" is not verbally expressed, leaving ICE25 to infer what is left implicit. In (2), ICE25 is struggling to come up with a new topic and uses two tokens of "so" to hold the floor while planning the upcoming utterance: the argument introduced by "so" bears no relation with previous context and "so" simply expresses a stalling and topic-shifting function. In these examples, interactivity plays an essential part since, in both cases, the incomplete structure is either turn-final (1) or turn-initial (2), pointing to the specific role of turn transitions in DM behavior.

Such non-relational functions of DMs are excluded from writing-based frameworks such as RST and PDTB where two abstract objects are required for any sense to be assigned. Yet, absence of left or right context is quite frequent for spoken DMs, as already mentioned in Degand and Simon-Vandenbergen (2011: 289), who talk about a "scale" of relationality, from "non-relational" markers (e.g., *actually*) to "strictly relational" (e.g., *because*) discourse markers. Some uses have become conventionalized as specific discourse functions: Estellés and Pons (2014) identified the "absolute initial position" which can only be filled by a limited number of DMs in Spanish (e.g., *bueno* 'well') that do not require previous context and that are typically used to signal the beginning of a new interaction. Similarly, final position (as in Example 1 above) is generally associated with intersubjective, elliptical or common-ground functions that invite the hearer to contribute to the discourse representation (see Haselow, 2012; Buysse, 2014; Degand, 2014), functions which are completely absent from most taxonomies of discourse relations. To date, most works on spoken

corpora (e.g. Tonelli et al., 2010; Rehbein et al., 2016; Riccardi et al., 2016) make a distinction between "connectives" and "discourse markers", that is, relational vs. non-relational uses, the latter being discarded although they are sometimes performed by the same expressions (cf. *but* and *so* in the examples above), thus maintaining a writing-based, strictly relational view of DMs.

4.2 Far-reaching Scope

Structures containing DMs in speech often display long-distance relationships, or "far-reaching scope" (Lenk, 1998: 247), as a result of the dynamic process of building a shared discourse representation. This feature is mainly displayed in two configurations: a DM relating to a distant previous context of which it is separated by a digression (location), or a DM taking scope over multiple utterances which, once combined, constitute its left argument (extent). This flexibility is not specific to speech: Unger (1996: 409), for instance, acknowledges that, in writing as well, "discourse connectives can have scope over an utterance or a group of utterances". Similarly, in the PDTB 2.0 (Prasad et al., 2008: 3), the extent and location of Arg1 are coded as separate variables, amounting to 617/18459 (3.34%) cases where Arg1 comprises multiple utterances and 1666/18459 (9%) cases where Arg1 is non-adjacent to Arg2 (the possibility of a non-adjacent Arg1 is restricted to explicit connectives only).

However, some writing-based taxonomies do not include relations which specifically function with a far-reaching scope, at a higher level of discourse organization. Feng et al. (2014: 1) oppose in this regard PDTB-style vs. RST-style annotations: "PDTB-style discourse relations encode only very shallow discourse structures, i.e., the relations are mostly local, e.g. within a single sentence or between two adjacent sentences", as opposed to RST which includes "long-distance discourse dependency" and higher-level relations such as topic-shift or topic-drift. In other words, according to the PDTB, the same discourse relation can have a local or global scope, but no relation is specific to the latter: the only potentially far-reaching relation type, viz. "list", has been removed from the latest version of their taxonomy (PDTB3, Webber et al., 2016).[3] Similarly, in CCR, relations between topics such as topic-shift or topic-resuming are excluded on the grounds that they are "orthogonal to another classification in terms of coherence" (Sanders et al., 2016), that is, any marker or relation expressing a higher-level function (e.g. topic-shift) necessarily encodes a more local relation such as contrast or consequence, thus forcing a lexical-semantic interpretation of the DM regardless of its meaning-in-context. Example (2) above seems to contradict this strong position, where "so" cannot be related to the previous context by any relation other than topic-shift.

It is, however, true that in some cases, the scope of the DM is not clear and seems to combine local and global meanings, as illustrated by Example (3) where both location and extent of Arg1 are quite flexible:

(3) BB1: could you talk a little bit about the Wirral accent I I know that um (0.200) there's obviously quite a um range of accents in that part of the country
BB4: yeah (0.520) uh well I (0.290) consider myself to have a Cheshire accent because when I was born (0.300) and I lived in (0.110) on the Wirral (0.287) uh (0.333) i- (0.460) it was a Cheshire accent which is (0.440) the accent I have now though (0.270) there are overtones of (0.230) the Liverpudlian accent (0.290) however over the years certainly it has changed (0.270) and now it's very much (0.110) a Liverpool accent (0.340) and uh you know which (0.430) I'm not (0.300) I'm not saying I disapprove of it but I think it's a lazy speech and you need to (0.440)

[3] It should be noted that, in the PDTB, the "NoRel" (i.e. absence of relation) option may mask the presence of possible long-distance relations, especially when their identification is unclear, in order to enhance consistency in the annotation. It remains that the PDTB taxonomy only covers typically local relations such as cause or contrast, and not typically far-reaching relations such as topic-shift.

> actually um (0.530) think about what you're saying I know my nephew sometimes'll to speak to me in the Liverpool accent (0.350) and I'll say please speak to me in English <laughing/> (0.160) but it's things like "yeah" and "you what" and (0.230) whereas you know mine is "yes" "pardon" or whatever <noise/> I'm a bit old-fashioned in that way **so I do find the accent (0.440) is a bit harsh** and it's interesting that actually that accent is spread out into the (0.270) uh (0.390) the parts of north Wales that are very near to the Wirral… (EN-intf-03)

In Example (3), the DM "so" introducing "I do find the accent is a bit harsh" can be interpreted in multiple ways depending on which left context it refers to. The most local interpretation connects it to the immediate co-text ("I'm a bit old-fashioned in that way"), in which case "so" would signal a consequence relation. Another possible interpretation is to relate it to the "nephew" anecdote, of which it introduces a conclusion. More convincingly, the evaluative content of the verb ("find") and adjective ("harsh") in the second argument echoes an earlier evaluative utterance: "I'm not saying I disapprove of it but I think it's a lazy speech". Lastly, "so" could also be interpreted as introducing the answer to the original question by the interviewer <BB1> "could you talk a little bit about the Wirral accent", in which case its function is to come back to the main topic after a lengthy digression. While a conservation decision would only annotate the local interpretation (consequence relation), a more accurate and comprehensive analysis could combine two senses (consequence and topic-resuming), an option which is available in many annotation models for both speech and writing.

Complex examples such as (3) tend to show that, while systematic annotation of DM scope would be particularly challenging (especially in spoken data), speech-friendly taxonomies should not deny the ability of DMs to express higher-level functions such as coming back to a previous topic. In the *DisFrEn* corpus, topic-relating DMs take up 6.07% of all annotated tokens, which would not be accounted for by writing-based models with a more restricted view of DM functions. Given that these functions are often expressed by frequent connectives such as *and* or *so*, which are also used in writing, this observation of far-reaching DMs in speech calls for more inclusive taxonomies for written corpora as well, in order to reach a better comparability across annotated corpora.

It thus appears that spoken DMs not only tend to take scope over large and distant segments (as in writing), but can also combine local and global scope simultaneously, making the annotation process quite complex and calling for specific function types at a higher level of discourse structure than what is included in local views of coherence (PDTB, CCR).

5 The Meaning of DMs

One of the most commented features of DMs is their multifunctionality (see for instance Mosegaard Hansen, 2006, 2008; Hummel, 2012). This feature, which can be directly associated with semantic and pragmatic ambiguity, is especially outstanding in speech, where a limited number of markers tend to be used with a relatively wide range of meanings and where context is a key-element in discourse production and processing.

5.1 Vagueness

The meaning of a DM in spoken/unplanned discourse is often (semantically and pragmatically) vague or not clearly definable, as opposed to the main tendency in written/planned discourse.[4] DMs can be ambiguous in writing as well, but these cases are much more typical of speech, especially

[4] Tuggy (1993) defines "vagueness" in cognitive-grammar terms as "meanings which are not well-entrenched but which have a relatively well-entrenched, elaboratively close schema subsuming them" (1993: 8).

in face-to-face settings where the speaker might expect the hearer to make use of various contextual cues (e.g., prosody, gestures) to reconstruct the speaker's intended meaning, an option which is not available for readers (Schober and Brennan, 2003). In addition, speech-specific DMs such as *well* or French *quoi* 'you know' do not encode a strong core meaning, as opposed to more explicit expressions in writing such as *by contrast* or *in addition*, which are virtually absent in speech: for instance, in *DisFrEn*, only one occurrence of *in addition* was found out of the total 8,743 annotated DMs, against 165 in the PDTB corpus out of 18,459 tokens.

While not all written DM occurrences are clear and unproblematic, similarly, not all spoken DMs are vague, and some forms tend to specialize in a given function, such as the very frequent *you know* which is mostly used to check for the hearer's attention and understanding. Yet, two degrees of difficulty related to vagueness are illustrated in (4) and (5) where the DM *I mean* departs from its basic reformulative meaning.

(4) ICE76: didn't John use to deal with uhm (1.850) divorce in his earlier days
ICE77: did he uhm
ICE76: found it quite depressing
ICE77: I imagine it probably is uhm
ICE76: all the toing and froing and
ICE77: **I mean** I sh- I should think you'd get over the uhm (0.110) the voyeuristic aspects in the early stages (EN-conv-04)

(5) ICE12: this is what we do all the time we sit and describe other people and **I mean** when people got stuck I'd just say look just list you imagine... (EN-conv-03)

In (4), *I mean* elaborates on the speaker's previous turn but it is not clear whether it introduces more detail ("it probably is depressing, by that I mean that you would get over the voyeuristic aspects") or a justification ("it probably is depressing, I say that because you would get over the voyeuristic aspects"), or a combination of both (see next section on multifunctionality). In (5), *I mean* does not fluctuate between two meanings, like in (4), but rather seems completely underspecified and functions as a semantically void "punctuant" (Vincent, 1993). In addition, its co-occurrence with *and* blurs its own functional contribution into the additive meaning of the conjunction (see section 5 on co-occurrence).

The treatment of cases like (4) and (5) does not only depend on the quality and coverage of the functional taxonomy used by the annotator. These problems are mostly due to the intrinsic ambiguity of language in general and of some DMs in particular. The challenge for the annotator is then to assign the appropriate function label within the taxonomy, striving to avoid "undefined" or "non-interpretable" categories which usually end up left out of quantitative analyses as outlier data. Therefore, a marker-based approach to DMs, i.e. starting from the identification of (a set of) DMs and systematically annotating their function(s), presents the additional challenge to deal with such vague cases and not only the more typical relational uses (such as *I mean* expressing reformulation or specification).

5.2 Polysemy and Multifunctionality of DMs

As already indicated, another challenging characteristic of DMs – in general and especially in speech – is their multifunctionality, which is at the very core of the category to a greater extent than more homogeneous pragmatic categories such as modal particles (associated with epistemic modality), interjections (associated with subjectivity) or response signals (associated with agreeing/disagreeing). As suggested in Crible (2017a: 107), three forms of multifunctionality can be distinguished:

> (1) the category covers items that perform many different functions; (2) a single member can perform different functions in different contexts; and (3) a single member can perform different functions simultaneously in the same context, given the great polysemy of DMs.

We will now turn to each of these degrees of multifunctionality to discuss their challenge for corpus annotation.

5.2.1 One Category with Different Functions

DMs can exhibit propositional functions indicating a logico-semantic relationship (e.g., consequence), but also non-propositional, mainly structural functions (e.g., topic-shift). In addition, some DMs add a modal, (inter)subjective value (e.g., agreement, monitoring, emphasis, etc.) to a structural function. These three categories (viz. propositional, structural, modal), borrowed from Cuenca (2013a), have a different weight in speech and in writing.

DMs acting at a propositional level are prevalent in planned monologues (36.5% of all DMs in news broadcasts vs. only 20% in conversations in *DisFrEn*), which can be taken as evidence for their higher attraction to written-to-be-spoken and, by extension, written discourse. Regarding function types, however, there is a common core of propositional relations in speech and writing, with examples of cause or contrast, as in (6), which are equally included in writing-based and speech-based taxonomies.

(6) I wasn't looking forward to do it **but** I am now it's going to be good (EN-phon-01)

DMs with structural functions are typical of both speech and writing, but each mode of communication tends to prefer certain types of structural functions over others. In (spoken and written) situations with intermediate or high planning, markers of global structure such as topic-shift or enumeration (Example 7) are quite frequent. In the *DisFrEn* corpus, news broadcast (highly prepared, written-to-be-spoken) is the only register where the topic-shift function ranks among the most frequent functions (5^{th} and 4^{th} in English and French, respectively). On the other hand, situations with low planning will make more use of local structuring devices such as continuity (Example 8).

(7) I will begin with a review of the economic situation and prospects (0.380) I shall **then** deal with monetary policy and public finances (0.220) **finally** I will present my tax proposals (EN-poli-02)

(8) you sit there in a canteen wherever you are **and** you sit **and** you listen **and** the conversation next to you someone's saying (EN-conv-03)

Global structural functions, such as discourse beginning, discourse closing or pre-closing, topic shift or turn change, are generally not taken into account – or not systematically – in writing-based taxonomies for DM functions, although they are very frequent in speech (14% of all DMs in *DisFrEn*; cf. Examples 2, 3, 7). As already mentioned above, only RST includes a category of topic relations, while the only structural relation in the PDTB is the local conjunction relation (typically expressed by *and* as in Example 8).

DMs that bracket units of talk while also performing modal functions are frequent in genres where interactivity is more prominent such as dialogues. Modal markers introducing units of talk are typically oral (e.g., *well*, *look*, *listen*). Some of these uses are covered by the question-answer relation in RST, although not all turn-initial DMs actually belong to such a well-defined structure, as in (9) where "look" follows an imperative utterance and not an interrogative one, thus expressing disagreement (modal) as well as turn-opening (structural).

(9) ICE5 have some banana bread
ICE6 **look** I'm not that much of a banana bread eater (EN-phon-08)

Regardless of the classifying system, authors agree on the multifunctionality of the DM category, although not always to the same degree of inclusiveness and granularity. As mentioned above, structural functions are usually excluded from writing-based taxonomies (e.g. PDTB, CCR) on the grounds that these relations function at a different, higher level of discourse coherence. Modal functions are, in turn, absent from these frameworks since they fail to meet the relationality criterion (e.g. a *you know* does not relate two arguments but merely takes scope over one utterance).

However, such an exclusion overlooks emerging modal uses of typical DMs such as French *mais* 'but' which, besides its relational functions (contrast, concession) can also be used structurally and/or modally in speech, as in (10).

(10) c'est fatigant tu vois on prend leur bics pour le TU ben euh (0.900) quoi **mais** on n'a pas dit qu'on voulait bien gnagna tu vois
it's exhausting you know we take their pens for the TU well uh (0.900) what **mais 'but'** *we did not say we were okay blabla you know* (FR-conv-05)

In this extract, the speaker is pseudo-reporting someone else's words ("quoi mais on n'a pas dit qu'on voulait bien"), where "mais" opens the reported segment and expresses disagreement. Once more, in a DM-based approach, such uses of "mais" cannot be discarded and have to be accounted for beyond what a purely relational (contrastive) reading would suggest. Furthermore, the inclusion of structural and modal functions in DM taxonomies is in line with seminal, empirically-evidenced theories of discourse domains such as Halliday's (1970) ideational-textual-interpersonal distinction, taken up by Schiffrin (1987), Redeker (1991) and many others since then.

5.2.2 One Marker with Different Functions in Different Contexts

DMs in speech/unplanned discourse tend to be multifunctional (Mosegaard Hansen, 2008; Hummel, 2012). While multifunctional or ambiguous expressions do occur in writing/planned discourse as well (e.g. *and*), writing tends to rely on a larger diversity of connectives, some of which have highly specific meanings (e.g. *in addition*), as opposed to speech where a few very generic markers are used extensively for many different functions. In *DisFrEn*, spoken registers with a high degree of preparation (political speeches, news broadcasts) show the highest type-token ratio of DMs (around 20 vs. only 6 in unplanned speech such as casual conversations). These corpus-based findings suggest that DM expressions are more varied in writing and in planned "written-to-be-spoken" discourse (see also Cuenca 2013b).

A case in point is the DM *and*. The DM *and* combines the problematic features of multifunctionality and vagueness or underspecification, a situation which, coupled with its high frequency in speech (the most frequent English DM in *DisFrEn*), makes it very complex to annotate reliably. *And* is quite pervasive in writing as well though not to the same extent as in speech: *and* takes up 26% of all DM occurrences in *DisFrEn*, as opposed to only 16% in the PDTB corpus. Table 1 compares the most frequent functions of *and* (more than 10 occurrences) in *DisFrEn* and in the PDTB corpus and their proportions over the total number of *and* tokens. We see that the functional range of *and* in the spoken corpus is much larger and more balanced than in writing, where only four different senses show more than 10 occurrences with an overwhelming majority of the basic conjunction relation.

Although the two corpora have been annotated with different taxonomies in potentially different degrees of granularity, both spoken and written *and* share a number of common functions: *addition* roughly corresponds to *conjunction*, *enumeration* to *list* and *consequence* to *result*. Other functions expressed by *and* in speech are included in the PDTB taxonomy but were not assigned to *and* in the written corpus, namely *specification*, *temporal* and *contrast*. Nevertheless, it is obvious that not all functions in the spoken corpus can be reduced to these core relational meanings: at least the structural functions of topic-shift and opening boundary must be differentiated from the basic meaning of *and* as a conjunction at sentence level (and its underspecified, contextually enriched uses such as contrast or temporality). While this latter group of structural functions is not part of the PDTB taxonomy, it remains that the majority of the labels attributed to *and* in speech (6 out of 11) are included in both annotation models, and yet are not distributed in the same way across the two modes of communication: more balanced proportions across more different function types in speech, overwhelming monopoly of one sense label (namely *conjunction*) in writing.

DisFrEn* (speech): 1140 *and	**PDTB (writing): 3000 *and***
Addition (57.11%)	Conjunction (90.76%)
Specification (15.79%)	List (7%)
Consequence (8.86%)	Result (1.26%)
Topic-shift (3.6%)	Juxtaposition (0.36%)
Temporal (2.37%)	
Punctuation (2.11%)	
Conclusion (1.75%)	
Topic-resuming (1.4%)	
Contrast (1.14%)	
Opening boundary (1.14%)	
Enumeration (0.88%)	

Table 1. Most frequent functions of *and* in speech vs. writing

In other words, these corpus-based results show that DMs tend to fulfil a wider functional range in speech than in writing, even for those expressions which do occur in both modalities and which share a common relational core such as *and*. Besides the inclusion of more different types of functions, this difference also suggests a greater complexity of spoken DM annotation where the annotators have to choose among many different possible senses for a single DM, including highly underspecified uses.

5.2.3 One Marker with Simultaneous Functions in the Same Context

The third level of multifunctionality refers to the tendency of DMs to perform more than one function at a time (see Petukhova and Bunt, 2009). It is generally agreed (e.g., Brinton, 1996: 35) that it is not always possible nor relevant to rank by order of semantic priming the respective weight of multiple functions in a single occurrence. These simultaneous functions can either belong to the same level or domain (11) or to different ones (12-13).

(11) these concerns are especially important (0.270) **as** we approach the crucial topic of economic and monetary union (EN-poli-01)

(12) and then there are the really bland ones that I think oh come on (0.130) **you know** (0.493) friendly (0.960) helpful (EN-conv-03)

(13) and that means **either** we're going to have to increase the amount of tax we pay (0.400) and none of us really wants to do that either (0.560) **or** we're going to have to reduce expenditure (EN-intf-04)

In example (11) "as" exhibits two functions from the propositional domain, namely a causal and a temporal meaning. Similarly, "you know" in Example (11), expresses both monitoring (modal) and specification (propositional), whereas "either…or" in (12) express alternative (propositional) and enumeration (structural).

Simultaneous functions of DMs are not more frequent in unplanned than in planned discourse: only 4% of all DMs in *DisFrEn* were assigned double labels, an average which is not particularly sensitive to variation in degrees of planning or interactivity (4.57% in conversations vs. 4.56% in political speeches). By contrast, results from written corpora tend to show a high frequency of double senses: for instance, Webber et al. (2016) report that 1002 out of 4138 relations between conjoined verb phrases are assigned two or three senses in the PDTB corpus.

Although this characteristic exists both in speech and writing, it involves different types of functions: in the PDTB, for instance, double senses only correspond to simultaneous discourse relations (e.g. conjunction-synchrony; see also Baldridge and Lascarides, 2005), whereas the multidimensionality of spoken communication is particularly prone to expressions working on

different levels or macro-functions at the same time. As Bunt (2012) puts it:

> The phenomenon of multifunctionality can be explained by considering participation in a dialogue as involving multiple activites at the same time, such as making progress in a given task or activity; monitoring attention and understanding; taking turns; managing time, and so on. (Bunt 2012: 243)

Once again, we see that writing-based taxonomies of discourse relations, in particular those excluding topic relations and modal meanings, would fail to account for the full multifunctionality of spoken DMs "participating in a network of ideational, interpersonal, and textual relations" (Goutsos 1996: 167).

6 Co-occurrence of DMs

DMs have been repeatedly shown, especially in speech-based research (e.g. Bazzanella, 2001; Pons, 2008; Cuenca and Marín, 2009; Dostie, 2013; but see also Fraser 2013 on writing), to frequently co-occur with each other. DM co-occurrence is very frequent in spoken language: up to 20% of all DMs in *DisFrEn* were coded as part of a co-occurring string of DMs, in combinations as varied as *and so*, *but I mean*, *because if* or *and actually*. To our knowledge, such information is not made available in discourse-annotated corpora. The PDTB reports on a different yet related phenomenon, which is the coordination of conjoined connectives: only *before and after*, *if and when* and *when and if* are attested for a total of five occurrences expressing combinations of temporal and conditional relations. More varied forms and functions of co-occurrence may well exist in writing, yet further empirical evidence is needed to effectively compare the proportion of co-occurring DMs across spoken and written corpora.

While comparisons of frequency are limited, differences remain as to the treatment of co-occurring DMs in speech- vs. writing-based annotation frameworks: in the latter, co-occurring DMs are treated as one complex unit or distinct type with only one sense label assigned to them; in the former, however, authors tend to acknowledge varying degrees of fixation, from simply juxtaposed DMs (in which case each component expresses a distinct function) to more and more bound combinations expressing one single function. With time and spread use, clustered DMs can indeed aggregate and combine into new "complex" DMs which are no longer separable and express a meaning that is not computable from their individual components (Waltereit, 2007), such as *and then* and its French equivalent *et puis*. Yet this is not systematically the case and this variation should be accounted for more systematically during DM identification and sense disambiguation.

One such proposal is provided by Cuenca and Marín's (2009) three-fold distinction between juxtaposition of DMs (different functions generally with different scopes), addition of DMs (different functions with the same scope) and composition of DMs (a single function performed by a complex unit whose components are not completely lexicalized).

Juxtaposition of markers implies that two or more markers co-occur but do not combine neither syntactically nor semantically. In many cases of co-occurrence, the two (or more) DMs remain "simply" juxtaposed, as in Example (14), where the meanings and functions of three DMs are serially added to each other.

(14) so it's actually a proper increasing function (2.833) ok (1.730) **so for example if** you wanted to supposing you're looking at sine x (EN-clas-04)

In (14), three different cases of connection can be identified, namely, consequence, exemplification and condition.

On the other hand, some co-occurrences imply some degree of integration of the components. Addition of markers implies two or more markers which combine and have the same scope. They usually act at a local level but still maintain their meanings and functions sufficiently distinct, as in (15).

(15) he's the guy who is supposed to have left and he had my papers **and so** that was the problem over the party (EN-conv-06)

In this example, "and" indicates its basic meaning of addition, marking the continuity of the following segment, while consecutive "so" specifies that this next segment ("that was the problem") is a conclusion to the previous context.[5]

Finally, composition of markers takes place when two co-occurring markers jointly contribute to indicating a single discourse function at a global level, as in (16).

(16) and she's feeding a baby (0.200) so uhm (0.200) **and then** yes of course this is a some sort of love scene going on (EN-clas-05)

In (16), "and then" acts as a complex marker indicating the continuation of the description of a situation. This case can be differentiated from other cases in which *and* and *then* can be attributed distinct functions, generally with *then* acting as a temporal marker, as in (17).

(17) I really found myself enjoying the first ten minutes **and then** suddenly (0.273) everything seemed to disintegrate (EN-intr-01)

The most integrated co-occurrences include DMs that indicate interactional values while delimiting main units of the narrative: the beginning, the end or a major transition place (turn, sequence and subsequence, enunciation). Other examples of this type are English *well then* when it is used as opening-up closings or *okay then* indicating a discourse boundary and marking continuation, although there were no occurrences in *DisFrEn*. Complex DMs are usually language-specific and even variety-specific (e.g., *ou sinon* in Belgian French, see Crible, 2015), although some are present cross-linguistically, such as *and then* and its French equivalent *et puis* (also existing in writing). The scale from juxtaposition to composition is in constant evolution, which is why lexicalization criteria are needed to draw the line between different stages of integration, following e.g., Himmelmann (2004).

In sum, DM co-occurrence is a pervasive and multi-faceted phenomenon in spoken language and should therefore be included in annotation frameworks in a more systematic yet flexible way than what is currently available in writing-based models, where it is either ignored or highly restricted. This difference of treatment in the literature might not necessarily reflect a relative difference of frequency in corpus data. Nevertheless, DM co-occurrence appears to be one area where studies on spoken language can enrich annotation models designed for both speech and writing.

7 Conclusion and Recommendations for Corpus Annotation

Some degree of DMs specialization depending on the mode of communication (spoken vs. written) can be observed, but planning and interactivity also play a crucial role on the use of DMs. Some DM configurations are typically oral and are usually related to unplanned and interactive discourse, while others are typical of written texts or, rather, planned discourse, either in written or spoken mode. Overall, it appears that markers in speech are associated with more varied structural configurations and multifunctionality at various levels (or "multidimensionality" in Petukhova and Bunt's (2011) terms), and thus potentially more complex to annotate. As a consequence, annotation instructions should be adapted/formulated according to the characteristics of spoken DMs in a systematic and comprehensive way, taking into account a number of relative tendencies which we have identified, quantified and illustrated.

The structure of speech is linearly intricate, lexically vaguer and includes more repetition than written discourse. Interactivity and low planning in dialogal genres are prone to repair, turn-taking

[5] The recurrence of *and so* in *DisFrEn* (26 occurrences) can be a telling sign of its increasing fixation as a new combined unit in language.

and overlapping. This implies the presence of truncated or independent clauses as well as long-distance relationships which pose a challenge to the interpretation of meaning and thus to annotation. In addition, DMs often seem to perform vague functions. Structural and modal functions (and combinations thereof) must be correctly identified and included in annotation taxonomies.

As a conclusion, we suggest the following recommendations for spoken corpus annotation to handle the problematic cases identified:

a) The absence of a textually expressed Arg1 or Arg2 must be considered as a structural possibility. It covers both non-relational DMs (that is, applying to one segment only) or relational DMs applying to at least one implicit segment such as a pragmatically available assumption or extra-linguistic context.
b) Longer excerpts must be taken into consideration to identify the scope of the DM. Simplified paraphrases can be used to identify the core structure. However, this is challenging to annotate consistently, and explicitly identifying the units under a DM's scope may be too ambitious, especially in long-distance relations (for both spoken and written data). We argue that sense disambiguation is informative and complex enough and should not necessarily be combined with an identification of the related segments.
c) Most DMs can act on different levels or domains, that is, they can implement propositional and non-propositional meanings. The "one form-one function" principle seldom applies. Structural and modal functions should be incorporated in general DM taxonomies. Specific disambiguating criteria should be established for operational annotation.
d) Double labels should be allowed. However, they must be restricted to true simultaneous multifunctionality and not used in case of hesitation between two senses. Whether or not double senses (e.g. causal-temporal) constitute new "complex" types of functions should be left to the analyst's choice depending on the method and research question.
e) Given the complexity of discourse annotation in spoken data, a tracking system to document the annotator's confidence during the process would be useful in order to retrieve ambiguous cases, and potentially discard them or at least distinguish them in the analysis.
f) DM co-occurrences should be differentiated and systematically annotated. Various degrees of integration must be identified and taken into account.

In conclusion, by identifying characteristics of DMs which are more frequent (if not only existing) in speech and by suggesting annotation recommendations, the research presented in this paper aims to make a contribution to a better description of the use of DMs in speech, and also to the development of annotation systems that can deal not only with written but also with spoken data. This would allow us to build inter-operable databases compiling evidence from multiple data types, thus considerably furthering our knowledge on the use and functions of this complex pragmatic category.[6]

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